

JC06 Rec'd PCT/PTO 28 MAR 2005

SEQUENCE LISTING

<110> Iwamoto, Aikichi
Tachikawa, Ai

<120> Methods For Enhancing Exogenous Epitope
Display on MHC Class 1 Through Inhibition of Tap Activity

<130> 50026/051001

<150> PCT/JP03/12595

<151> 2003-10-01

<150> JP 2002-288394

<151> 2002-10-01

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gtgaaagttc atcgcggccg c 69

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 aaat 64

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<400> 38
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Leu Glu
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 <222> (1)...(42)

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 <220>
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 <400> 42
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 <221> CDS
 <222> (41)...(58)

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 Met Asp Leu Leu Ile
 1 5

 cgt 58
 Arg

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1 5

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<211> 55

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<221> CDS

<222> (1)...(42)

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Ile Arg Arg Cys Gly Ser Gly Ala His His His His His His
1 5 10

tgatagcggc cgc 55

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<211> 2960

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tatctagtga gcaggcggcc gctttcgatt tcgctttccc ctaa atg gct gag ctt 176
Met Ala Glu Leu
1

ctc gcc agc gca gga tca gcc tgt tcc tgg gac ttt ccg aga gcc ccg 224
Leu Ala Ser Ala Gly Ser Ala Cys Ser Trp Asp Phe Pro Arg Ala Pro
5 10 15 20

ccc tgc ttc cct ccc cca gcc gcc agt agg gga gga ctc ggc ggt acc	272
Pro Ser Phe Pro Pro Pro Ala Ala Ser Arg Gly Gly Leu Gly Gly Thr	
25 30 35	
cgg agc ttc agg ccc cac cgg ggc gcg gag agt ccc agg ccc ggc cgg	320
Arg Ser Phe Arg Pro His Arg Gly Ala Glu Ser Pro Arg Pro Gly Arg	
40 45 50	
gac cgg gac ggc gtc cga gtg cca atg gct agc tct agg tgt ccc gct	368
Asp Arg Asp Gly Val Arg Val Pro Met Ala Ser Ser Arg Cys Pro Ala	
55 60 65	
ccc cgc ggg tgc cgc tgc ctc ccc gga gct tct ctc gca tgg ctg ggg	416
Pro Arg Gly Cys Arg Cys Leu Pro Gly Ala Ser Leu Ala Trp Leu Gly	
70 75 80	
aca gta ctg cta ctt ctc gcc gac tgg gtg ctg ctc cgg acc gcg ctg	464
Thr Val Leu Leu Leu Leu Ala Asp Trp Val Leu Leu Arg Thr Ala Leu	
85 90 95 100	
ccc cgc ata ttc tcc ctg ctg gtg ccc acc gcg ctg cca ctg ctc cgg	512
Pro Arg Ile Phe Ser Leu Leu Val Pro Thr Ala Leu Pro Leu Leu Arg	
105 110 115	
gtc tgg gcg gtg ggc ctg agc cgc tgg gcc gtg ctc tgg ctg ggg gcc	560
Val Trp Ala Val Gly Leu Ser Arg Trp Ala Val Leu Trp Leu Gly Ala	
120 125 130	
tgc ggg gtc ctc agg gca acg gtt ggc tcc aag agc gaa aac gca ggt	608
Cys Gly Val Leu Arg Ala Thr Val Gly Ser Lys Ser Glu Asn Ala Gly	
135 140 145	
gcc cag ggc tgg ctg gct gct ttg aag cca tta gct gcg gca ctg ggc	656
Ala Gln Gly Trp Leu Ala Ala Leu Lys Pro Leu Ala Ala Ala Leu Gly	
150 155 160	
ttg gcc ctg ccg gga ctt gcc ttg ttc cga gag ctg atc tca tgg gga	704
Leu Ala Leu Pro Gly Leu Ala Leu Phe Arg Glu Leu Ile Ser Trp Gly	
165 170 175 180	
gcc ccc ggg tcc gcg gat agc acc agg cta ctg cac tgg gga agt cac	752
Ala Pro Gly Ser Ala Asp Ser Thr Arg Leu Leu His Trp Gly Ser His	
185 190 195	
cct acc gcc ttc gtt gtc agt tat gca gcg gca ctg ccc gca gca gcc	800
Pro Thr Ala Phe Val Val Ser Tyr Ala Ala Ala Leu Pro Ala Ala Ala	
200 205 210	
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Leu Trp His Lys Leu Gly Ser Leu Trp Val Pro Gly Gly Gln Gly Gly	
215 220 225	
tct gga aac cct gtg cgt cgg ctt cta ggc tgc ctg ggc tcg gag acg	896
Ser Gly Asn Pro Val Arg Arg Leu Leu Gly Cys Leu Gly Ser Glu Thr	
230 235 240	

cgc cgc ctc tcg ctg ttc ctg gtc ctg gtg gtc ctc tcc tct ctt ggg	944
Arg Arg Leu Ser Leu Phe Leu Val Leu Val Val Leu Ser Ser Leu Gly	
245 250 255 260	
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Glu Met Ala Ile Pro Phe Phe Thr Gly Arg Leu Thr Asp Trp Ile Leu	
265 270 275	
caa gat ggc tca gcc gat acc ttc act cga aac tta act ctc atg tcc	1040
Gln Asp Gly Ser Ala Asp Thr Phe Thr Arg Asn Leu Thr Leu Met Ser	
280 285 290	
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Ile Leu Thr Ile Ala Ser Ala Val Leu Glu Phe Val Gly Asp Gly Ile	
295 300 305	
tat aac aac acc atg ggc cac gtg cac agc cac ttg cag gga gag gtg	1136
Tyr Asn Asn Thr Met Gly His Val His Ser His Leu Gln Gly Glu Val	
310 315 320	
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Phe Gly Ala Val Leu Arg Gln Glu Thr Glu Phe Phe Gln Gln Asn Gln	
325 330 335 340	
aca ggt aac atc atg tct cgg gta aca gag gac acg tcc acc ctg agt	1232
Thr Gly Asn Ile Met Ser Arg Val Thr Glu Asp Thr Ser Thr Leu Ser	
345 350 355	
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Asp Ser Leu Ser Glu Asn Leu Ser Leu Phe Leu Trp Tyr Leu Val Arg	
360 365 370	
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Gly Leu Cys Leu Leu Gly Ile Met Leu Trp Gly Ser Val Ser Leu Thr	
375 380 385	
atg gtc acc ctg atc acc ctg cct ctg ctt ttc ctt ctg ccc aag aag	1376
Met Val Thr Leu Ile Thr Leu Pro Leu Leu Phe Leu Leu Pro Lys Lys	
390 395 400	
gtg gga aaa tgg tac cag ttg ctg gaa gtg cag gtg cgg gaa tct ctg	1424
Val Gly Lys Trp Tyr Gln Leu Leu Glu Val Gln Val Arg Glu Ser Leu	
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Ala Lys Ser Ser Gln Val Ala Ile Glu Ala Leu Ser Ala Met Pro Thr	
425 430 435	
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Val Arg Ser Phe Ala Asn Glu Glu Gly Glu Ala Gln Lys Phe Arg Glu	
440 445 450	
aag ctg caa gaa ata aag aca ctc aac cag aag gag gct gtg gcc tat	1568
Lys Leu Gln Glu Ile Lys Thr Leu Asn Gln Lys Glu Ala Val Ala Tyr	
455 460 465	
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Ala Val Asn Ser Trp Thr Thr Ser Ile Ser Gly Met Leu Leu Lys Val	
470 475 480	
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Gly Ile Leu Tyr Ile Gly Gly Gln Leu Val Thr Ser Gly Ala Val Ser	
485 490 495 500	
agt ggg aac ctt gtc aca ttt gtt ctc tac cag atg cag ttc acc cag	1712
Ser Gly Asn Leu Val Thr Phe Val Leu Tyr Gln Met Gln Phe Thr Gln	
505 510 515	
gct gtg gag gta ctg ctc tcc atc tac ccc aga gta cag aag gct gtg	1760
Ala Val Glu Val Leu Leu Ser Ile Tyr Pro Arg Val Gln Lys Ala Val	
520 525 530	
ggc tcc tca gag aaa ata ttt gag tac ctg gac cgc acc cct cgc tgc	1808
Gly Ser Ser Glu Lys Ile Phe Glu Tyr Leu Asp Arg Thr Pro Arg Cys	
535 540 545	
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Pro Pro Ser Gly Leu Leu Thr Pro Leu His Leu Glu Gly Leu Val Gln	
550 555 560	
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Phe Gln Asp Val Ser Phe Ala Tyr Pro Asn Arg Pro Asp Val Leu Val	
565 570 575 580	
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Val Gly Pro Asn Gly Ser Gly Lys Ser Thr Val Ala Ala Leu Leu Gln	
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aat ctg tac cag ccc acc ggg gga cag ctg ctg ttg gat ggg aag ccc	2048
Asn Leu Tyr Gln Pro Thr Gly Gly Gln Leu Leu Leu Asp Gly Lys Pro	
615 620 625	
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Leu Pro Gln Tyr Glu His Arg Tyr Leu His Arg Gln Val Ala Ala Val	
630 635 640	
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Gly Gln Glu Pro Gln Val Phe Gly Arg Ser Leu Gln Glu Asn Ile Ala	
645 650 655 660	
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Tyr Gly Leu Thr Gln Lys Pro Thr Met Glu Glu Ile Thr Ala Ala Ala	
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Val Lys Ser Gly Ala His Ser Phe Ile Ser Gly Leu Pro Gln Gly Tyr	
680 685 690	
gac aca gag gta gac gag gct ggg agc cag ctg tca ggg ggt cag cga	2288
Asp Thr Glu Val Asp Glu Ala Gly Ser Gln Leu Ser Gly Gly Gln Arg	

695	700	705	
cag gca gtg gcg ttg gcc cga gca ttg atc cgg aaa ccg tgt gta ctt			2336
Gln Ala Val Ala Leu Ala Arg Ala Leu Ile Arg Lys Pro Cys Val Leu			
710	715	720	
atc ctg gat gat gcc acc agt gcc ctg gat gca aac agc cag tta cag			2384
Ile Leu Asp Asp Ala Thr Ser Ala Leu Asp Ala Asn Ser Gln Leu Gln			
725	730	735	740
gtg gag cag ctc ctg tac gaa agc cct gag cgg tac tcc cgc tca gtg			2432
Val Glu Gln Leu Leu Tyr Glu Ser Pro Glu Arg Tyr Ser Arg Ser Val			
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ctt ctc atc acc cag cac ctc agc ctg gtg gag cag gct gac cac atc			2480
Leu Leu Ile Thr Gln His Leu Ser Leu Val Glu Gln Ala Asp His Ile			
760	765	770	
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Leu Phe Leu Glu Gly Gly Ala Ile Arg Glu Gly Gly Thr His Gln Gln			
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Leu Met Glu Lys Lys Gly Cys Tyr Trp Ala Met Val Gln Ala Pro Ala			
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805			
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35 40 45			
Arg Pro Gly Arg Asp Arg Asp Gly Val Arg Val Pro Met Ala Ser Ser			
50 55 60			
Arg Cys Pro Ala Pro Arg Gly Cys Arg Cys Leu Pro Gly Ala Ser Leu			
65 70 75 80			
Ala Trp Leu Gly Thr Val Leu Leu Leu Leu Ala Asp Trp Val Leu Leu			
85 90 95			
Arg Thr Ala Leu Pro Arg Ile Phe Ser Leu Leu Val Pro Thr Ala Leu			
100 105 110			

Pro Leu Leu Arg Val Trp Ala Val Gly Leu Ser Arg Trp Ala Val Leu
 115 120 125
 Trp Leu Gly Ala Cys Gly Val Leu Arg Ala Thr Val Gly Ser Lys Ser
 130 135 140
 Glu Asn Ala Gly Ala Gln Gly Trp Leu Ala Ala Leu Lys Pro Leu Ala
 145 150 155 160
 Ala Ala Leu Gly Leu Ala Leu Pro Gly Leu Ala Leu Phe Arg Glu Leu
 165 170 175
 Ile Ser Trp Gly Ala Pro Gly Ser Ala Asp Ser Thr Arg Leu Leu His
 180 185 190
 Trp Gly Ser His Pro Thr Ala Phe Val Val Ser Tyr Ala Ala Ala Leu
 195 200 205
 Pro Ala Ala Ala Leu Trp His Lys Leu Gly Ser Leu Trp Val Pro Gly
 210 215 220
 Gly Gln Gly Gly Ser Gly Asn Pro Val Arg Arg Leu Leu Gly Cys Leu
 225 230 235 240
 Gly Ser Glu Thr Arg Arg Leu Ser Leu Phe Leu Val Leu Val Val Leu
 245 250 255
 Ser Ser Leu Gly Glu Met Ala Ile Pro Phe Phe Thr Gly Arg Leu Thr
 260 265 270
 Asp Trp Ile Leu Gln Asp Gly Ser Ala Asp Thr Phe Thr Arg Asn Leu
 275 280 285
 Thr Leu Met Ser Ile Leu Thr Ile Ala Ser Ala Val Leu Glu Phe Val
 290 295 300
 Gly Asp Gly Ile Tyr Asn Asn Thr Met Gly His Val His Ser His Leu
 305 310 315 320
 Gln Gly Glu Val Phe Gly Ala Val Leu Arg Gln Glu Thr Glu Phe Phe
 325 330 335
 Gln Gln Asn Gln Thr Gly Asn Ile Met Ser Arg Val Thr Glu Asp Thr
 340 345 350
 Ser Thr Leu Ser Asp Ser Leu Ser Glu Asn Leu Ser Leu Phe Leu Trp
 355 360 365
 Tyr Leu Val Arg Gly Leu Cys Leu Leu Gly Ile Met Leu Trp Gly Ser
 370 375 380
 Val Ser Leu Thr Met Val Thr Leu Ile Thr Leu Pro Leu Leu Phe Leu
 385 390 395 400
 Leu Pro Lys Lys Val Gly Lys Trp Tyr Gln Leu Leu Glu Val Gln Val
 405 410 415
 Arg Glu Ser Leu Ala Lys Ser Ser Gln Val Ala Ile Glu Ala Leu Ser
 420 425 430
 Ala Met Pro Thr Val Arg Ser Phe Ala Asn Glu Glu Gly Glu Ala Gln
 435 440 445
 Lys Phe Arg Glu Lys Leu Gln Glu Ile Lys Thr Leu Asn Gln Lys Glu
 450 455 460
 Ala Val Ala Tyr Ala Val Asn Ser Trp Thr Thr Ser Ile Ser Gly Met
 465 470 475 480
 Leu Leu Lys Val Gly Ile Leu Tyr Ile Gly Gly Gln Leu Val Thr Ser
 485 490 495
 Gly Ala Val Ser Ser Gly Asn Leu Val Thr Phe Val Leu Tyr Gln Met
 500 505 510
 Gln Phe Thr Gln Ala Val Glu Val Leu Leu Ser Ile Tyr Pro Arg Val
 515 520 525
 Gln Lys Ala Val Gly Ser Ser Glu Lys Ile Phe Glu Tyr Leu Asp Arg
 530 535 540
 Thr Pro Arg Cys Pro Pro Ser Gly Leu Leu Thr Pro Leu His Leu Glu
 545 550 555 560
 Gly Leu Val Gln Phe Gln Asp Val Ser Phe Ala Tyr Pro Asn Arg Pro

Trp	Leu	Glu	Gly	Thr	Leu	Arg	Leu	Gly	Gly	Leu	Trp	Gly	Leu	Leu	Lys	
40						45					50					
cta	aga	ggg	ctg	ctg	gga	ttt	gtg	ggg	aca	ctg	ctg	ctc	ccg	ctc	tgt	306
Leu	Arg	Gly	Leu	Leu	Gly	Phe	Val	Gly	Thr	Leu	Leu	Leu	Pro	Leu	Cys	
55					60					65					70	
ctg	gcc	acc	ccc	ctg	act	gtc	tcc	ctg	aga	gcc	ctg	gtc	gcg	ggg	gcc	354
Leu	Ala	Thr	Pro	Leu	Thr	Val	Ser	Leu	Arg	Ala	Leu	Val	Ala	Gly	Ala	
				75					80					85		
tca	cgt	gct	ccc	cca	gcc	aga	gtc	gct	tca	gcc	cct	tgg	agc	tgg	ctg	402
Ser	Arg	Ala	Pro	Pro	Ala	Arg	Val	Ala	Ser	Ala	Pro	Trp	Ser	Trp	Leu	
			90					95					100			
ctg	gtg	ggg	tac	ggg	gct	gcg	ggg	ctc	agc	tgg	tca	ctg	tgg	gct	gtt	450
Leu	Val	Gly	Tyr	Gly	Ala	Ala	Gly	Leu	Ser	Trp	Ser	Leu	Trp	Ala	Val	
	105						110					115				
ctg	agc	cct	cct	gga	gcc	cag	gag	aag	gag	cag	gac	cag	gtg	aac	aac	498
Leu	Ser	Pro	Pro	Gly	Ala	Gln	Glu	Lys	Glu	Gln	Asp	Gln	Val	Asn	Asn	
	120					125					130					
aaa	gtc	ttg	atg	tgg	agg	ctg	ctg	aag	ctc	tcc	agg	ccg	gac	ctg	cct	546
Lys	Val	Leu	Met	Trp	Arg	Leu	Leu	Lys	Leu	Ser	Arg	Pro	Asp	Leu	Pro	
135					140					145					150	
ctc	ctc	gtt	gcc	gcc	ttc	ttc	ttc	ctt	gtc	ctt	gct	gtt	ttg	ggt	gag	594
Leu	Leu	Val	Ala	Ala	Phe	Phe	Phe	Leu	Val	Leu	Ala	Val	Leu	Gly	Glu	
				155					160					165		
aca	tta	atc	cct	cac	tat	tct	ggt	cgt	gtg	att	gac	atc	ctg	gga	ggt	642
Thr	Leu	Ile	Pro	His	Tyr	Ser	Gly	Arg	Val	Ile	Asp	Ile	Leu	Gly	Gly	
			170					175					180			
gat	ttt	gac	ccc	cat	gcc	ttt	gcc	agt	gcc	atc	ttc	ttc	atg	tgc	ctc	690
Asp	Phe	Asp	Pro	His	Ala	Phe	Ala	Ser	Ala	Ile	Phe	Phe	Met	Cys	Leu	
	185						190					195				
ttc	tcc	ttt	ggc	agc	tca	ctg	tct	gca	ggc	tgc	cga	gga	ggc	tgc	ttc	738
Phe	Ser	Phe	Gly	Ser	Ser	Leu	Ser	Ala	Gly	Cys	Arg	Gly	Gly	Cys	Phe	
	200					205					210					
acc	tac	acc	atg	tct	cga	atc	aac	ttg	cgg	atc	cgg	gag	cag	ctt	ttc	786
Thr	Tyr	Thr	Met	Ser	Arg	Ile	Asn	Leu	Arg	Ile	Arg	Glu	Gln	Leu	Phe	
215					220					225					230	
tcc	tcc	ctg	ctg	cgc	cag	gac	ctc	ggt	ttc	ttc	cag	gag	act	aag	aca	834
Ser	Ser	Leu	Leu	Arg	Gln	Asp	Leu	Gly	Phe	Phe	Gln	Glu	Thr	Lys	Thr	
				235					240					245		
ggg	gag	ctg	aac	tca	cgg	ctg	agc	tcg	gat	acc	acc	ctg	atg	agt	aac	882
Gly	Glu	Leu	Asn	Ser	Arg	Leu	Ser	Ser	Asp	Thr	Thr	Leu	Met	Ser	Asn	
			250					255					260			
tgg	ctt	cct	tta	aat	gcc	aat	gtg	ctc	ttg	cga	agc	ctg	gtg	aaa	gtg	930
Trp	Leu	Pro	Leu	Asn	Ala	Asn	Val	Leu	Leu	Arg	Ser	Leu	Val	Lys	Val	

265	270	275	
gtg ggg ctg tat ggc ttc atg ctc agc ata tcg cct cga ctc acc ctc			978
Val Gly Leu Tyr Gly Phe Met Leu Ser Ile Ser Pro Arg Leu Thr Leu			
280	285	290	
ctt tct ctg ctg cac atg ccc ttc aca ata gca gcg gag aag gtg tac			1026
Leu Ser Leu Leu His Met Pro Phe Thr Ile Ala Ala Glu Lys Val Tyr			
295	300	305	310
aac acc cgc cat cag gaa gtg ctt cgg gag atc cag gat gca gtg gcc			1074
Asn Thr Arg His Gln Glu Val Leu Arg Glu Ile Gln Asp Ala Val Ala			
	315	320	325
agg gcg ggg cag gtg gtg cgg gaa gcc gtt gga ggg ctg cag acc gtt			1122
Arg Ala Gly Gln Val Val Arg Glu Ala Val Gly Gly Leu Gln Thr Val			
	330	335	340
cgc agt ttt ggg gcc gag gag cat gaa gtc tgt cgc tat aaa gag gcc			1170
Arg Ser Phe Gly Ala Glu Glu His Glu Val Cys Arg Tyr Lys Glu Ala			
	345	350	355
ctt gaa caa tgt cgg cag ctg tat tgg cgg aga gac ctg gaa cgc gcc			1218
Leu Glu Gln Cys Arg Gln Leu Tyr Trp Arg Arg Asp Leu Glu Arg Ala			
	360	365	370
ttg tac ctg ctc ata agg agg gtg ctg cac ttg ggg gtg cag atg ctg			1266
Leu Tyr Leu Leu Ile Arg Arg Val Leu His Leu Gly Val Gln Met Leu			
375	380	385	390
atg ctg agc tgt ggg ctg cag cag atg cag gat ggg gag ctc acc cag			1314
Met Leu Ser Cys Gly Leu Gln Gln Met Gln Asp Gly Glu Leu Thr Gln			
	395	400	405
ggc agc ctg ctt tcc ttt atg atc tac cag gag agc gtg ggg agc tat			1362
Gly Ser Leu Leu Ser Phe Met Ile Tyr Gln Glu Ser Val Gly Ser Tyr			
	410	415	420
gtg cag acc ctg gta tac ata tat ggg gat atg ctc agc aac gtg gga			1410
Val Gln Thr Leu Val Tyr Ile Tyr Gly Asp Met Leu Ser Asn Val Gly			
	425	430	435
gct gca gag aag gtt ttc tcc tac atg gac cga cag cca aat ctg cct			1458
Ala Ala Glu Lys Val Phe Ser Tyr Met Asp Arg Gln Pro Asn Leu Pro			
	440	445	450
tca cct ggc acg ctt gcc ccc acc act ctg cag ggg gtt gtg aaa ttc			1506
Ser Pro Gly Thr Leu Ala Pro Thr Thr Leu Gln Gly Val Val Lys Phe			
455	460	465	470
caa gac gtc tcc ttt gca tat ccc aat cgc cct gac agg cct gtg ctc			1554
Gln Asp Val Ser Phe Ala Tyr Pro Asn Arg Pro Asp Arg Pro Val Leu			
	475	480	485
aag ggg ctg acg ttt acc cta cgt cct ggt gag gtg acg gcg ctg gtg			1602
Lys Gly Leu Thr Phe Thr Leu Arg Pro Gly Glu Val Thr Ala Leu Val			
	490	495	500

gga ccc aat ggg tct ggg aag agc aca gtg gct gcc ctg ctg cag aat	1650
Gly Pro Asn Gly Ser Gly Lys Ser Thr Val Ala Ala Leu Leu Gln Asn	
505 510 515	
ctg tac cag ccc aca ggg gga cag gtg ctg ctg gat gaa aag ccc atc	1698
Leu Tyr Gln Pro Thr Gly Gly Gln Val Leu Leu Asp Glu Lys Pro Ile	
520 525 530	
tca cag tat gaa cac tgc tac ctg cac agc cag gtg gtt tca gtt ggg	1746
Ser Gln Tyr Glu His Cys Tyr Leu His Ser Gln Val Val Ser Val Gly	
535 540 545 550	
cag gag cct gtg ctg ttc tcc ggt tct gtg agg aac aac att gct tat	1794
Gln Glu Pro Val Leu Phe Ser Gly Ser Val Arg Asn Asn Ile Ala Tyr	
555 560 565	
ggg ctg cag agc tgc gaa gat gat aag gtg atg gcg gct gcc cag gct	1842
Gly Leu Gln Ser Cys Glu Asp Asp Lys Val Met Ala Ala Ala Gln Ala	
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gcc cac gca gat gac ttc atc cag gaa atg gag cat gga ata tac aca	1890
Ala His Ala Asp Asp Phe Ile Gln Glu Met Glu His Gly Ile Tyr Thr	
585 590 595	
gat gta ggg gag aag gga agc cag ctg gct gcg gga cag aaa caa cgt	1938
Asp Val Gly Glu Lys Gly Ser Gln Leu Ala Ala Gly Gln Lys Gln Arg	
600 605 610	
ctg gcc att gcc cgg gcc ctt gta cga gac ccg cgg gtc ctc atc ctg	1986
Leu Ala Ile Ala Arg Ala Leu Val Arg Asp Pro Arg Val Leu Ile Leu	
615 620 625 630	
gat gag gct act agt gcc cta gat gtg cag tgc gag cag gcc ctg cag	2034
Asp Glu Ala Thr Ser Ala Leu Asp Val Gln Cys Glu Gln Ala Leu Gln	
635 640 645	
gac tgg aat tcc cgt ggg gat cgc aca gtg ctg gtg att gct cac agg	2082
Asp Trp Asn Ser Arg Gly Asp Arg Thr Val Leu Val Ile Ala His Arg	
650 655 660	
ctg cag gca gtt cag cgc gcc cac cag atc ctg gtg ctc cag gag ggc	2130
Leu Gln Ala Val Gln Arg Ala His Gln Ile Leu Val Leu Gln Glu Gly	
665 670 675	
aag ctg cag aag ctt gcc cag ctc cag gag gga cag gac ctc tat tcc	2178
Lys Leu Gln Lys Leu Ala Gln Leu Gln Glu Gly Gln Asp Leu Tyr Ser	
680 685 690	
cgc ctg gtt cag cag cgg ctg atg gac tgaggcccca gggatactgg	2225
Arg Leu Val Gln Gln Arg Leu Met Asp	
695 700	
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gcttttggtg ggggtggagag gtgggggtggg gtgggggtgtg gtgggggtggg aggctgtctg	2405
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cttcctggag ataaccatag ttgctatttt gctgcctgtc ccatcagtcg tttatctgtt 2645
gtttgagata gaaattaacc aaaaatgaca taaatattca tgagattgcc ttcctatatc 2705
cttccttggt cctaccagtg tctgctattt tgaagaagct agggctctga gggacagaga 2765
acagttccct gattaacagt attaatagcg acattggtaa cagctaccat ttatagagtt 2825
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cccaacccta tgagggttggg tattatcccc attttacaga tgaggaaaact gaagctcaaa 2945
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caccagagag gtttctctac cattagcttc cctcttccgg ccattcttca caaagtcatt 3245
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ctccatgtgc ttctatcact gtgcgggttac ctctttcaca gcccttttaa agttctatct 3605
tccctttccc accttttttg accttccact agaccatgag cacctgggag gaaagccata 3665
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<210> 50
<211> 703
<212> PRT
<213> Homo sapiens

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<400> 50
Met Arg Leu Pro Asp Leu Arg Pro Trp Thr Ser Leu Leu Leu Val Asp
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Ala Ala Leu Leu Trp Leu Leu Gln Gly Pro Leu Gly Thr Leu Leu Pro
20     25     30
Gln Gly Leu Pro Gly Leu Trp Leu Glu Gly Thr Leu Arg Leu Gly Gly
35     40     45
Leu Trp Gly Leu Leu Lys Leu Arg Gly Leu Leu Gly Phe Val Gly Thr
50     55     60
Leu Leu Leu Pro Leu Cys Leu Ala Thr Pro Leu Thr Val Ser Leu Arg
65     70     75     80
Ala Leu Val Ala Gly Ala Ser Arg Ala Pro Pro Ala Arg Val Ala Ser
85     90     95
Ala Pro Trp Ser Trp Leu Leu Val Gly Tyr Gly Ala Ala Gly Leu Ser
100    105    110
Trp Ser Leu Trp Ala Val Leu Ser Pro Pro Gly Ala Gln Glu Lys Glu
115    120    125
Gln Asp Gln Val Asn Asn Lys Val Leu Met Trp Arg Leu Leu Lys Leu
130    135    140
Ser Arg Pro Asp Leu Pro Leu Leu Val Ala Ala Phe Phe Leu Val
145    150    155    160
Leu Ala Val Leu Gly Glu Thr Leu Ile Pro His Tyr Ser Gly Arg Val
165    170    175
Ile Asp Ile Leu Gly Gly Asp Phe Asp Pro His Ala Phe Ala Ser Ala
180    185    190
Ile Phe Phe Met Cys Leu Phe Ser Phe Gly Ser Ser Leu Ser Ala Gly
195    200    205
Cys Arg Gly Gly Cys Phe Thr Tyr Thr Met Ser Arg Ile Asn Leu Arg
210    215    220
Ile Arg Glu Gln Leu Phe Ser Ser Leu Leu Arg Gln Asp Leu Gly Phe

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225					230					235				240
Phe	Gln	Glu	Thr	Lys	Thr	Gly	Glu	Leu	Asn	Ser	Arg	Leu	Ser	Ser Asp
				245					250				255	
Thr	Thr	Leu	Met	Ser	Asn	Trp	Leu	Pro	Leu	Asn	Ala	Asn	Val	Leu Leu
			260					265					270	
Arg	Ser	Leu	Val	Lys	Val	Val	Gly	Leu	Tyr	Gly	Phe	Met	Leu	Ser Ile
		275					280					285		
Ser	Pro	Arg	Leu	Thr	Leu	Leu	Ser	Leu	Leu	His	Met	Pro	Phe	Thr Ile
	290					295					300			
Ala	Ala	Glu	Lys	Val	Tyr	Asn	Thr	Arg	His	Gln	Glu	Val	Leu	Arg Glu
305				310					315					320
Ile	Gln	Asp	Ala	Val	Ala	Arg	Ala	Gly	Gln	Val	Val	Arg	Glu	Ala Val
			325					330					335	
Gly	Gly	Leu	Gln	Thr	Val	Arg	Ser	Phe	Gly	Ala	Glu	Glu	His	Glu Val
		340					345					350		
Cys	Arg	Tyr	Lys	Glu	Ala	Leu	Glu	Gln	Cys	Arg	Gln	Leu	Tyr	Trp Arg
	355					360					365			
Arg	Asp	Leu	Glu	Arg	Ala	Leu	Tyr	Leu	Leu	Ile	Arg	Arg	Val	Leu His
	370				375					380				
Leu	Gly	Val	Gln	Met	Leu	Met	Leu	Ser	Cys	Gly	Leu	Gln	Gln	Met Gln
385			390						395					400
Asp	Gly	Glu	Leu	Thr	Gln	Gly	Ser	Leu	Leu	Ser	Phe	Met	Ile	Tyr Gln
			405					410					415	
Glu	Ser	Val	Gly	Ser	Tyr	Val	Gln	Thr	Leu	Val	Tyr	Ile	Tyr	Gly Asp
		420				425					430			
Met	Leu	Ser	Asn	Val	Gly	Ala	Ala	Glu	Lys	Val	Phe	Ser	Tyr	Met Asp
	435				440						445			
Arg	Gln	Pro	Asn	Leu	Pro	Ser	Pro	Gly	Thr	Leu	Ala	Pro	Thr	Thr Leu
	450				455					460				
Gln	Gly	Val	Val	Lys	Phe	Gln	Asp	Val	Ser	Phe	Ala	Tyr	Pro	Asn Arg
465			470					475						480
Pro	Asp	Arg	Pro	Val	Leu	Lys	Gly	Leu	Thr	Phe	Thr	Leu	Arg	Pro Gly
		485					490						495	
Glu	Val	Thr	Ala	Leu	Val	Gly	Pro	Asn	Gly	Ser	Gly	Lys	Ser	Thr Val
	500					505					510			
Ala	Ala	Leu	Leu	Gln	Asn	Leu	Tyr	Gln	Pro	Thr	Gly	Gly	Gln	Val Leu
	515				520						525			
Leu	Asp	Glu	Lys	Pro	Ile	Ser	Gln	Tyr	Glu	His	Cys	Tyr	Leu	His Ser
	530			535				540						
Gln	Val	Val	Ser	Val	Gly	Gln	Glu	Pro	Val	Leu	Phe	Ser	Gly	Ser Val
545			550					555						560
Arg	Asn	Asn	Ile	Ala	Tyr	Gly	Leu	Gln	Ser	Cys	Glu	Asp	Asp	Lys Val
		565					570						575	
Met	Ala	Ala	Ala	Gln	Ala	Ala	His	Ala	Asp	Asp	Phe	Ile	Gln	Glu Met
	580					585						590		
Glu	His	Gly	Ile	Tyr	Thr	Asp	Val	Gly	Glu	Lys	Gly	Ser	Gln	Leu Ala
	595				600						605			
Ala	Gly	Gln	Lys	Gln	Arg	Leu	Ala	Ile	Ala	Arg	Ala	Leu	Val	Arg Asp
	610			615					620					
Pro	Arg	Val	Leu	Ile	Leu	Asp	Glu	Ala	Thr	Ser	Ala	Leu	Asp	Val Gln
625			630					635						640
Cys	Glu	Gln	Ala	Leu	Gln	Asp	Trp	Asn	Ser	Arg	Gly	Asp	Arg	Thr Val
		645					650						655	
Leu	Val	Ile	Ala	His	Arg	Leu	Gln	Ala	Val	Gln	Arg	Ala	His	Gln Ile
	660					665					670			
Leu	Val	Leu	Gln	Glu	Gly	Lys	Leu	Gln	Lys	Leu	Ala	Gln	Leu	Gln Glu
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Gly Gln Asp Leu Tyr Ser Arg Leu Val Gln Gln Arg Leu Met Asp
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<210> 51
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<212> DNA
<213> Human herpesvirus 1

<220>
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<222> (1)...(264)

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gtt ggg ccc agg acg tac gcc gac gta cgc gat gag atc aat aaa agg 96
Val Gly Pro Arg Thr Tyr Ala Asp Val Arg Asp Glu Ile Asn Lys Arg
20 25 30
ggg cgt gag gac cgg gag gcg gcc aga acc gcc gtg cac gac ccg gag 144
Gly Arg Glu Asp Arg Glu Ala Ala Arg Thr Ala Val His Asp Pro Glu
35 40 45
cgt ccc ctg ctg cgc tct ccc ggg ctg ctg ccc gaa atc gcc ccc aac 192
Arg Pro Leu Leu Arg Ser Pro Gly Leu Leu Pro Glu Ile Ala Pro Asn
50 55 60
gca tcc ttg ggt gtg gca cat cga aga acc ggc ggg acc gtg acc gac 240
Ala Ser Leu Gly Val Ala His Arg Arg Thr Gly Gly Thr Val Thr Asp
65 70 75 80
agt ccc cgt aat ccg gta acc cgt 264
Ser Pro Arg Asn Pro Val Thr Arg
85

<210> 52
<211> 88
<212> PRT
<213> Human herpesvirus 1

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20 25 30
Gly Arg Glu Asp Arg Glu Ala Ala Arg Thr Ala Val His Asp Pro Glu
35 40 45
Arg Pro Leu Leu Arg Ser Pro Gly Leu Leu Pro Glu Ile Ala Pro Asn
50 55 60
Ala Ser Leu Gly Val Ala His Arg Arg Thr Gly Gly Thr Val Thr Asp
65 70 75 80
Ser Pro Arg Asn Pro Val Thr Arg
85

<210> 53
 <211> 549
 <212> DNA
 <213> Human cytomegalovirus

<220>
 <221> CDS
 <222> (1)...(549)
 <223>

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 Met Asp Leu Leu Ile Arg Leu Gly Phe Leu Leu Met Cys Ala Leu Pro
 1 5 10 15

acc ccc ggt gag cgg tct tcg cgt gac ccg aaa acc ctt ctc tct ctg 96
 Thr Pro Gly Glu Arg Ser Ser Arg Asp Pro Lys Thr Leu Leu Ser Leu
 20 25 30

tct ccg cga caa caa gct tgt gtt ccg aga acg aag tcg cac aga ccc 144
 Ser Pro Arg Gln Gln Ala Cys Val Pro Arg Thr Lys Ser His Arg Pro
 35 40 45

gtt tgt tac aac gat aca ggg gac tgc aca gat gca gat gat agc tgg 192
 Val Cys Tyr Asn Asp Thr Gly Asp Cys Thr Asp Ala Asp Asp Ser Trp
 50 55 60

aaa cag ctg ggt gag gac ttt gcg cac caa tgc ttg cag gcg gcg aaa 240
 Lys Gln Leu Gly Glu Asp Phe Ala His Gln Cys Leu Gln Ala Ala Lys
 65 70 75 80

aag agg cct aaa acg cac aaa tcc cgt ccg aac gat agg aac ctt gag 288
 Lys Arg Pro Lys Thr His Lys Ser Arg Pro Asn Asp Arg Asn Leu Glu
 85 90 95

ggg agg ctg acc tgt caa cga gtc cgt ccg cta ctg ccc tgt gat ttg 336
 Gly Arg Leu Thr Cys Gln Arg Val Arg Arg Leu Leu Pro Cys Asp Leu
 100 105 110

gat att cat cct agc cac cgg ttg tta acg ctt atg aat aac tgc gtc 384
 Asp Ile His Pro Ser His Arg Leu Leu Thr Leu Met Asn Asn Cys Val
 115 120 125

tgt gac ggg gcc gtt tgg aac gcg ttt cgc ttg ata gaa cga cac gga 432
 Cys Asp Gly Ala Val Trp Asn Ala Phe Arg Leu Ile Glu Arg His Gly
 130 135 140

ttc ttc gct gtg act ttg tat tta tgt tgc ggg att act ctg ctg gtt 480
 Phe Phe Ala Val Thr Leu Tyr Leu Cys Cys Gly Ile Thr Leu Leu Val
 145 150 155 160

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 35 40 45
 Val Cys Tyr Asn Asp Thr Gly Asp Cys Thr Asp Ala Asp Asp Ser Trp
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 Lys Gln Leu Gly Glu Asp Phe Ala His Gln Cys Leu Gln Ala Ala Lys
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 Lys Arg Pro Lys Thr His Lys Ser Arg Pro Asn Asp Arg Asn Leu Glu
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 Gly Arg Leu Thr Cys Gln Arg Val Arg Arg Leu Leu Pro Cys Asp Leu
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 Asp Ile His Pro Ser His Arg Leu Leu Thr Leu Met Asn Asn Cys Val
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 Cys Asp Gly Ala Val Trp Asn Ala Phe Arg Leu Ile Glu Arg His Gly
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 Phe Phe Ala Val Thr Leu Tyr Leu Cys Cys Gly Ile Thr Leu Leu Val
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 Val Ile Leu Ala Leu Leu Cys Ser Ile Thr Tyr Glu Ser Thr Gly Arg
 165 170 175
 Gly Ile Arg Arg Cys Gly Ser
 180